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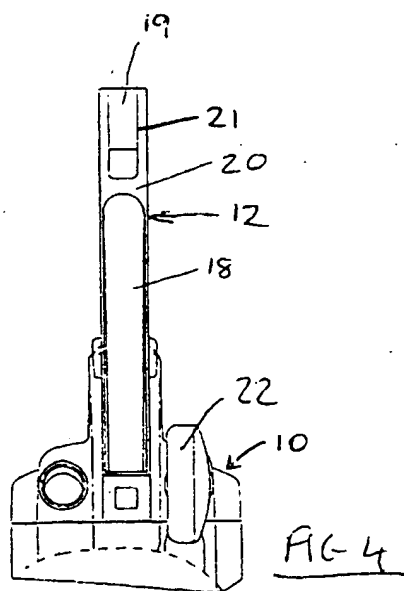
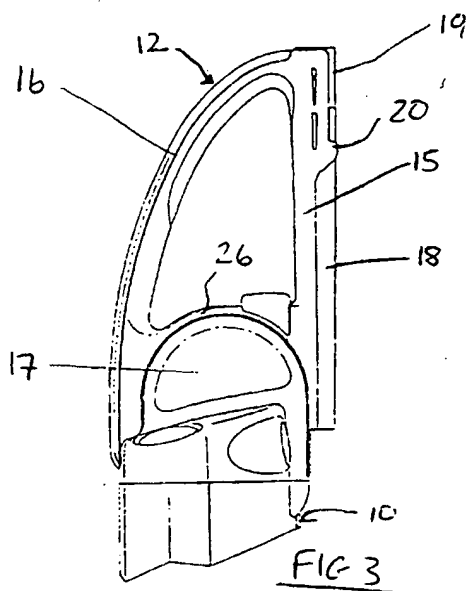
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(54) Abstract Title
Suction cleaner handle for storing accessory tools

(57) A vacuum cleaner comprises an upright body portion 10 pivotally connected at its lower end to a cleaning head portion 11, an elongate rigid suction extension tube 18, and a handle 12 extending from the upper end of the upright body portion 10 for pushing and guiding the cleaner in normal floor-cleaning use. The handle 12 comprises an elongate rear portion 15 extending upwardly from the body portion 10 and an arcuate front portion 16 extending downwardly from the upper end of the rear portion 15 of the handle 12 to a point on the body portion 10 located forwardly of the point from which the elongate rear portion 15 extends.

The shape of the handle 12 provides a wide range of locations for the user to comfortably grasp the handle, whilst the elongate rear portion 15 of the handle 12 defines a location for receiving and storing the elongate rigid extension tube 18, when not in use for cleaning.



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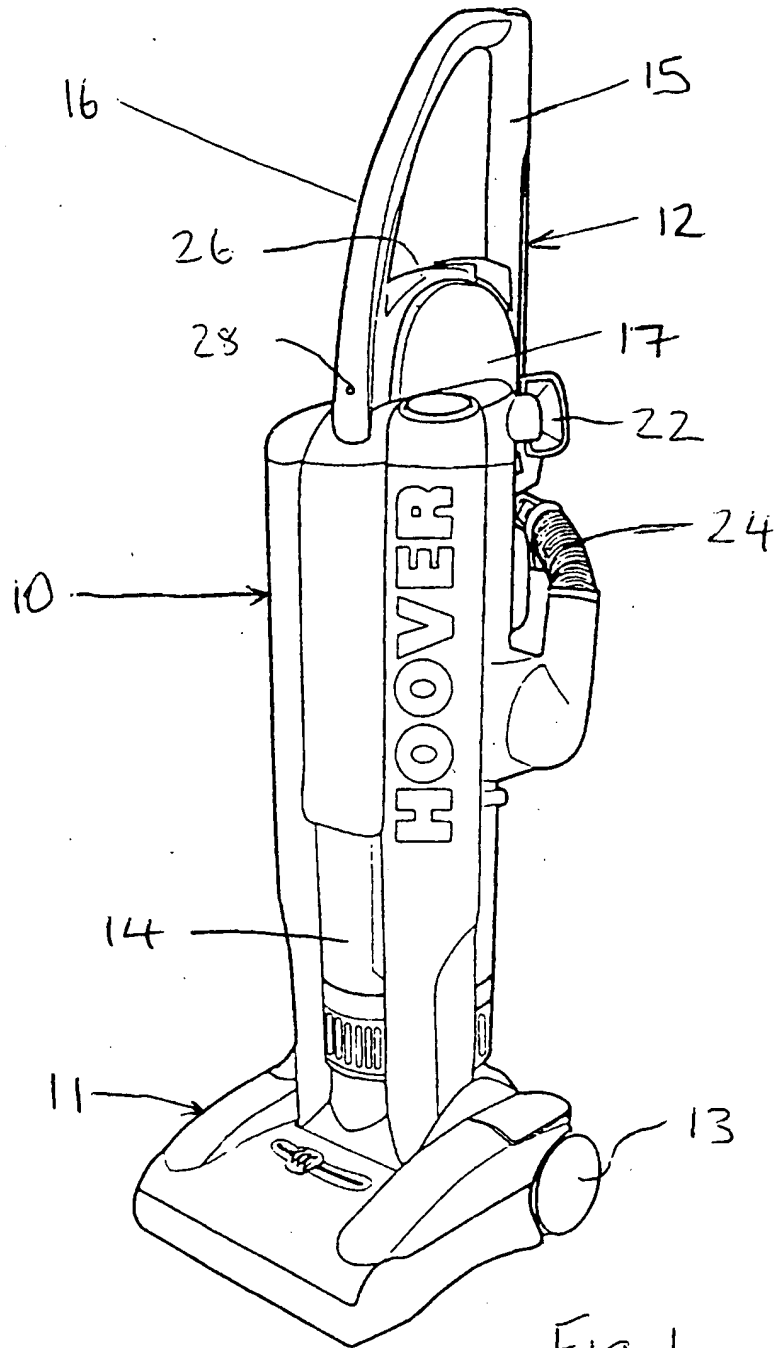
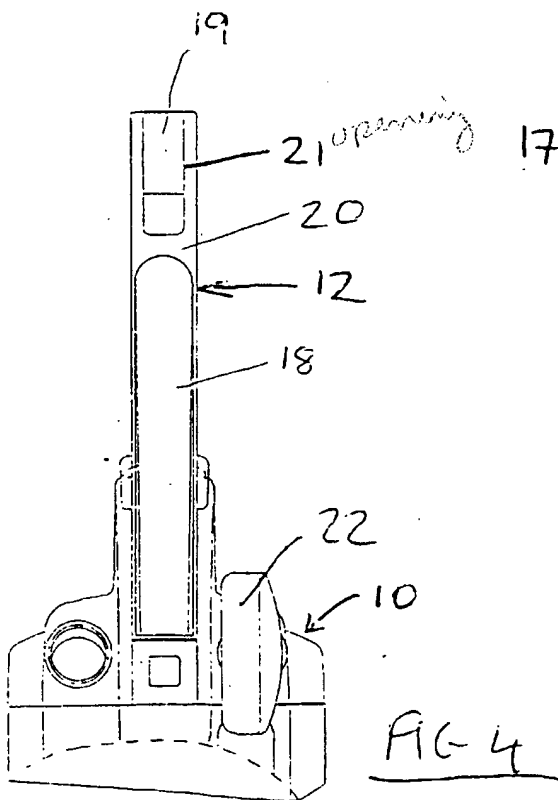
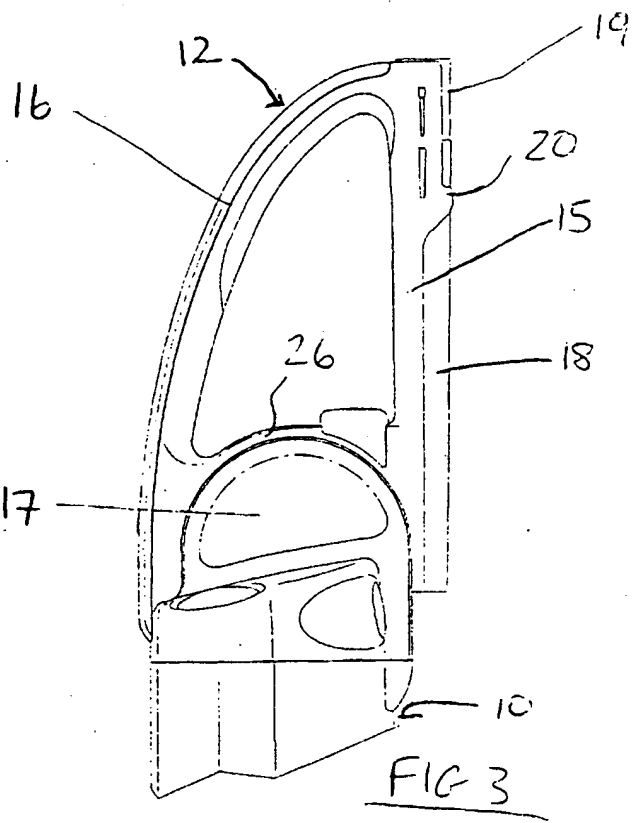
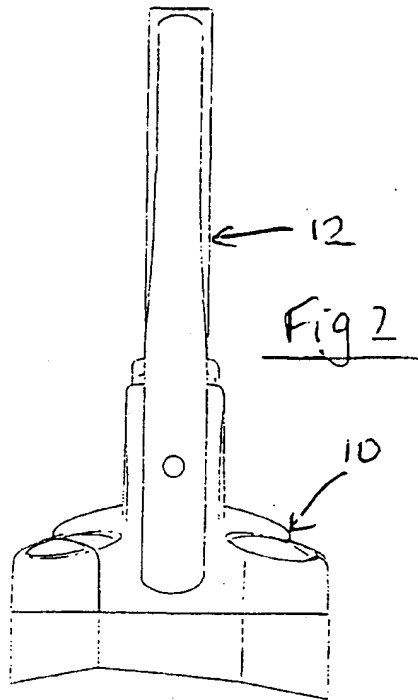
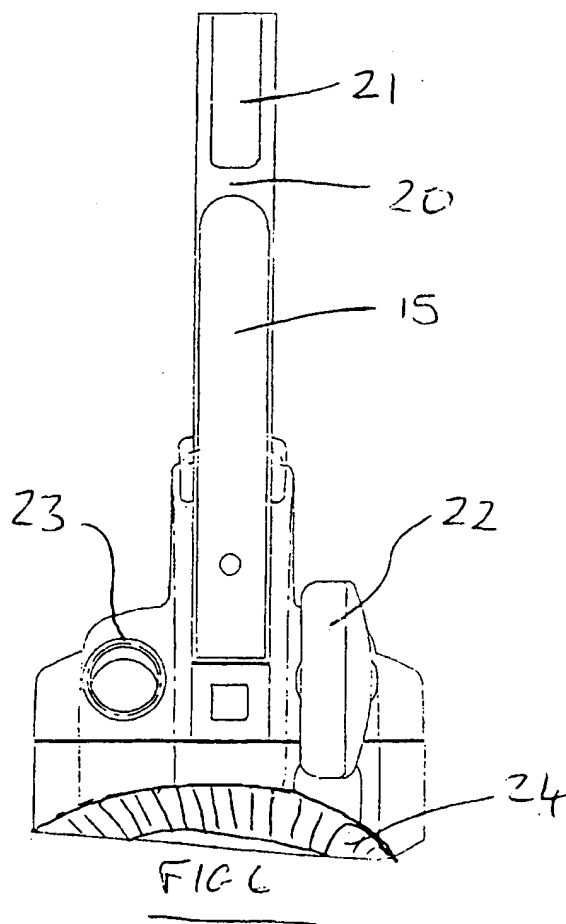
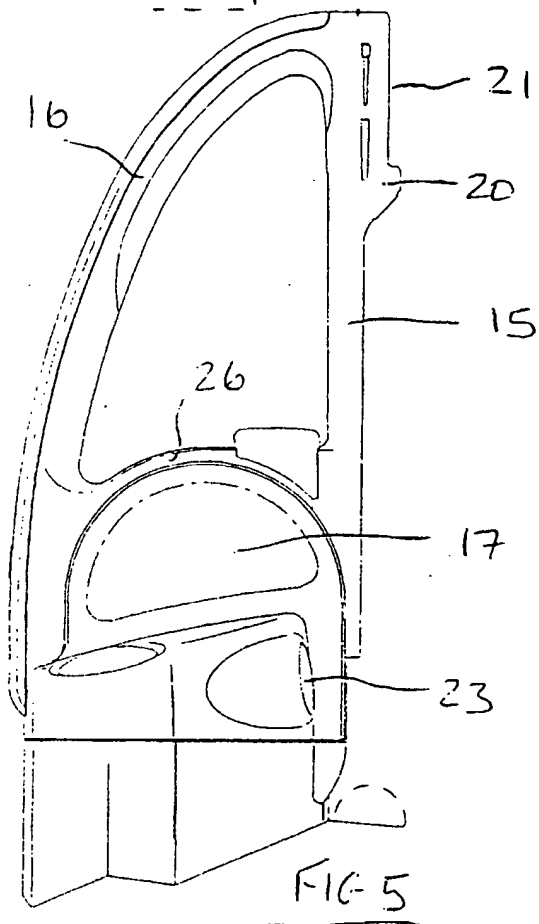
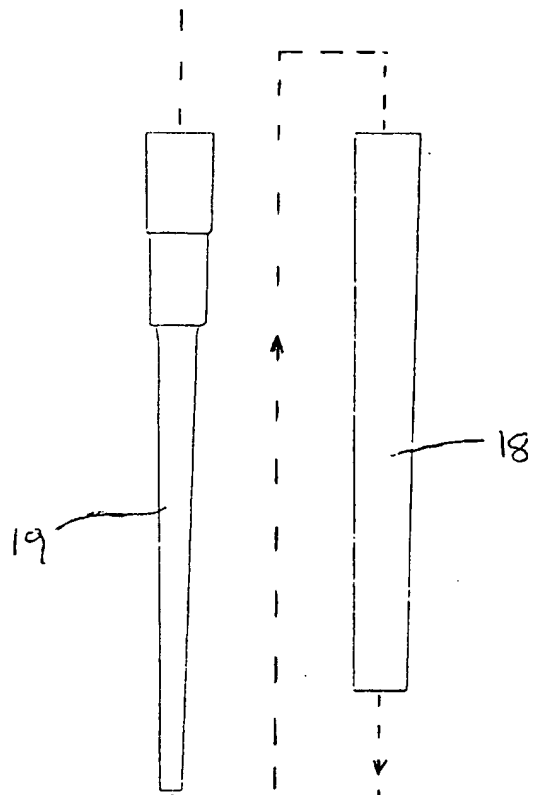


Fig 1

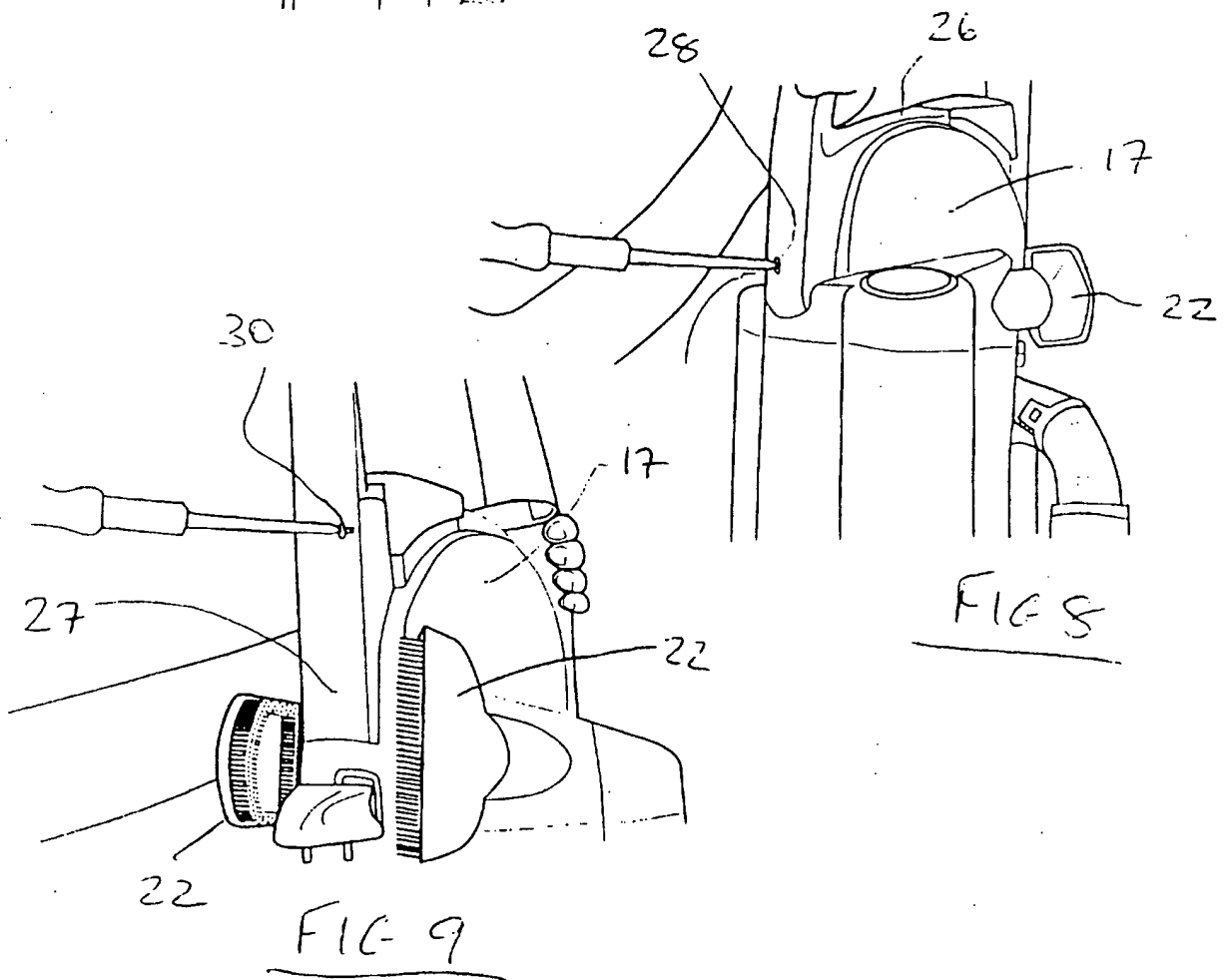
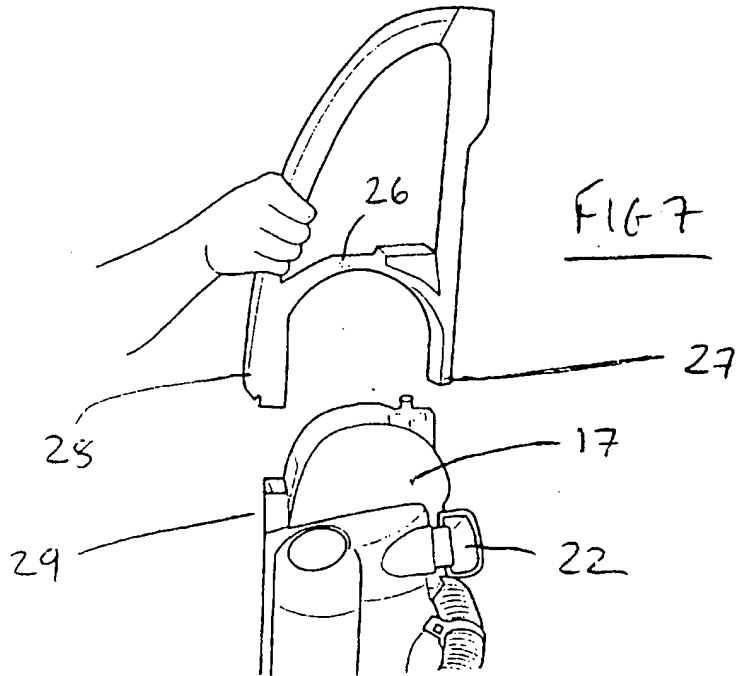
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VACUUM CLEANER

This invention relates to a vacuum cleaner.

Virtually all vacuum cleaners today have a clean-air fan system, whereby the fan draws air out of a rigid bag chamber, which contains the dust bag. Air and entrained dirt are thus
5 drawn into the dust bag by way of the dirty air duct from the cleaning nozzle. For upright vacuum cleaners, adoption of clean air fan systems has given rise to heavy plastic dust bag enclosures in place of the traditional light fabric outer bag, of the type used on older upright cleaners with dirty-air fans.

10 Vacuum cleaners with clean-air fan systems have made permanently-connected suction hoses for above-floor cleaning a realistic proposition, this facility giving rise to a need to accommodate hoses, rigid suction extension tubes and tools on the body of the cleaner. In addition to the trend towards hard-bag
15 upright cleaners with above-floor cleaning and clean-air fan systems, motor power has steadily increased in response to the demands of the market, further adding to the weight of the cleaner. An inevitable consequence of the aforementioned trends has been increased weight of the cleaner and a corresponding loss
20 of ease of handling.

The conventional upright vacuum cleaner of the 1990s has a clean-air fan system driven by a heavy conventional series-wound commutator type electric motor of up to 1500 Watt rated power and a dust bag enclosure of the rigid plastic hard-bag
25 type. The rear of the enclosure is formed with recessed storage locations for receiving the suction hose, rigid suction extension tubes and above-floor cleaning tools.

Vacuum cleaners incorporating one or more cyclonic separators instead of a dust bag have been known since the
30 1930's. A disadvantage of vacuum cleaners incorporating cyclonic separators is that the separators are often quite large and thus there can be insufficient room on the rear of the body of the cleaner to mount rigid suction extension tubes and above-floor

cleaning tools, without making the cleaner too bulky: This can also be a problem with conventional cleaners, particularly those having extra dust filtration, large capacity dust bags or reusable dust collection arrangements.

- 5 Another disadvantage of mounting the cleaning tools etc. on the rear of the cleaner is that they are often mounted quite low, with the result that the user has to bend down to remove or replace them.

Conventionally, the cleaner body is provided at its upper
10 end with a simple non-adjustable backwardly-inclined handle, of the type used on upright vacuum cleaners since the early days of such appliances. Such conventional handles are tailored to provide one grip position for the user's hand, which is convenient for a user of average stature to push the cleaner
15 across the floor being cleaned but not necessarily suitable for a user of small stature, or for carrying the cleaner bodily to its place of use.

It has been proposed to overcome the above-mentioned tool storage problems by using the rigid suction extension tube as the
20 actual handle of the cleaner, with the hand-grip of the tube serving as both a hand grip to grasp the rigid suction extension tube for above-floor cleaning and, with the tube in its stowed position on the cleaner, as a hand grip for pushing and guiding the cleaner in normal floor-cleaning use. Such arrangements,
25 which in some cases also incorporate suction hose storage on the outside of the rigid suction tube, exhibit the disadvantage that, with the rigid suction tube detached from the main cleaner body for above-floor cleaning, the cleaner is effectively without a handle and therefore difficult to move into a desired location
30 for a cleaning task.

Another disadvantage of conventional upright vacuum cleaners of the 1990s is that they are heavy to pull back and thus the user's hand is often liable to slip off the handle during cleaning. Vacuum cleaner handles generally comprise a
35 hollow moulding of plastics material, which can flex or break relatively easily, especially if the cleaner is heavy.

We have now devised a vacuum cleaner, which alleviates the above-mentioned problems.

In accordance with this invention, there is provided a vacuum cleaner comprising an upright body portion pivotally
5 connected at its lower end to a cleaning head portion, a plurality of floor cleaning tools including an elongate rigid extension tube, and a handle extending from the upper end of the upright body portion for pushing and guiding the cleaner in normal floor-cleaning use, the handle comprising an elongate rear
10 portion extending upwardly from the body portion and an inclined front portion extending downwardly from the upper end of the rear portion of the handle to a point on the body portion located forwardly of the point from which the elongate rear portion extends, said elongate rear portion defining a location for
15 receiving and storing said elongate rigid extension tube.

The closed-loop shape of the handle provides a wide range of locations for the user to grasp the handle, with the inclined configuration providing the necessary purchase for pushing, pulling turning and lifting the cleaner. Furthermore, the closed-
20 loop shape prevents the user's hand from slipping off the cleaner as it is pushed to-and-fro.

It will be appreciated that the two portions of the handle reinforce each other and thus strengthen the handle, so that it is difficult to bend and break.

25 Furthermore, the elongate rear portion defines a location for receiving and storing the elongate rigid extension tube, when not in use for cleaning and thus the user does not have to bend down to remove or replace the elongate rigid extension tube. This configuration also helps to keep minimise the size of the body
30 portion, since the elongate rigid extension tube is stored away from the body portion.

Preferably, the longitudinal axis of the rear portion of the handle is orientated parallel to the principal axis of the body portion of the cleaner.

35 Preferably, the inclined front portion of the handle is arcuate.

Preferably, the rear portion of the handle defines a longitudinally-extending passage, for receiving the elongate rigid extension tube.

Preferably, the passage is provided with an opening at or
5 adjacent the upper end of the rear portion of the handle.

Preferably, the rear portion of the handle is substantially c-shaped in section.

In one embodiment, the elongate rigid extension tube is frictionally engaged in the passage defined by said c-section
10 rear portion of the handle, by moving the tube transverse of itself through the longitudinally-extending mouth of the passage.

Preferably, the elongate rigid extension tube is retained by a pair of projecting tabs on the mouth of the passage.

Preferably, means are provided at the lower end of the
15 passage for receiving the lower end of the elongate rigid extension tube.

In an alternative embodiment, the passage comprises an opening at its upper end, through which the elongate rigid extension tube is inserted.

20 Preferably, the opening extends at least partially down the rear wall of the passage, so that the end of the elongate rigid extension tube can be inserted at an angle into the passage.

Preferably, at least one further elongate rigid extension
25 tube or cleaning tool is nested inside said first-mentioned elongate rigid extension tube.

Preferably, the innermost nested elongate rigid extension tube has an end portion having a narrow cross-sectional shape, so that it can be used as a so-called crevice tool for cleaning in
30 confined areas.

Preferably, a plurality of cleaning tools are provided for connecting to the end of the or each elongate rigid extension tube, said tools being mounted to the body of the cleaner, adjacent the upper end thereof.

35 An embodiment of this invention will now be described by way example only and with reference to the accompanying drawings,

in which:

Figure 1 is a perspective view of an upright vacuum cleaner in accordance with this invention;

Figure 2 is a front view of the handle of the vacuum cleaner of Figure 1;

Figure 3 is a side view of the handle of the vacuum cleaner of Figure 1;

Figure 4 is a rear view of the handle of the vacuum cleaner of Figure 1;

Figure 5 is a side view of the handle of the vacuum cleaner of Figure 1; with the extension tubes of the cleaner removed;

Figure 6 is a rear view of the handle of the vacuum cleaner of Figure 1; with the extension tubes of the cleaner removed;

Figures 7 to 9 are perspective views, showing how the handle is attached to the vacuum cleaner of Figure 1.

Referring to Figure 1 of the drawings, there is shown a vacuum cleaner comprising a head portion 11, a body portion 10 pivotally mounted to the head portion 11 and a handle 12 at the upper end of the body portion 10.

The head portion 11 comprises a plurality of floor-engaging wheels e.g. 13 and a rotary agitator (not shown) having brushes, which engage the floor surface. The body portion 10 comprises a motor driven fan (not shown) and bagless dust separation components, including a removable collection bin 14.

The handle 12 comprises a rear upright portion 15 and a front arcuate portion 16. An upward extension 17 of the body portion 10 encloses a storage reel for containing a rewindable power flex.

Referring to Figures 2 to 6 of the drawings, there is shown the handle 12 in greater detail. The rear upright portion 15 is c-shaped in section and defines a passage in which a tapered elongate rigid extension tube 18 and a nested crevice tool 19 are retained and stored. A section 20 at the upper end of the rear of the upright portion 15 of the handle is ring-shaped

in section.

The crevice tool 19 fits inside the rigid suction tube 18 and the latter is simply dropped through an opening 21 at the upper end of the passage, into its stowed position in the rear portion 15 of the handle 12. The extension tube 18 has a tapered form, such that the tube falls, smaller-diameter end downwards, until it is arrested when the tube 18 walls engage the ring-shaped section 20.

The opening 21 extends part way down the rear of the ring-shaped section 20, thereby enabling the tube to be inserted into the passage at an inclined angle and simply released, whereupon it is urged into the correct attitude as it falls, until it is finally arrested in a hanging position as explained above.

It will be evident that the shape and size of the front portion 16 of the handle 12, provide scope for the user of the vacuum cleaner to grip the handle in a variety of positions, the choice of position depending on the stature of the user and whether the cleaner is being pushed, pulled or carried.

A plurality of locations 23 are provided at the upper end of the rear of the body portion 10 for receiving cleaning tools 22, which in use, can either be directly engaged with the free end of the flexible suction hose 24 or engaged with the narrow end of the tapered rigid suction tube 18, once the opposite end of the tube 18 has been engaged with the free end of the flexible suction hose 24.

It will be appreciated that the hose attachments 18, 19, 22 are mounted at a high level on the cleaner and thus the user does not have to bend down to remove or replace the tools.

Referring to Figure 7 of the drawings, the handle 12 is preferably provided separately from the rest of the cleaner, in order to minimise the size of the packaging carton in which the cleaner is supplied. The handle 12 is formed from two halves of moulded plastics material, which are fitted together to form the two opposite sides of the handle 10.

The lower ends of the front and rear portions 16, 15 of

the handle 12 are preferably interconnected by an arcuate cross-member 26, which fits over the power flex reel enclosure 17. Hollow extensions 27,28 project downwardly from the lower ends of the front and rear portions 16,15 of the handle 12.

5 The handle 12 is attached to the body 10 by engaging the extensions 27,28 into respective rectangular-section sockets 29 on the front and rear of the body 10. The handle is then secured in place by inserting screws through the side walls of the sockets 29 and into the extensions 27,28. A cap bearing a logo is
10 then adhered over the front screw 28, in order to conceal it from view.

It will be appreciated that the handle of the cleaner is strong and comfortable to grip.

Claims

1. A vacuum cleaner comprising an upright body portion pivotally connected at its lower end to a cleaning head portion, a plurality of floor cleaning tools including an elongate rigid
5 extension tube, and a handle extending from the upper end of the upright body portion for pushing and guiding the cleaner in normal floor-cleaning use, the handle comprising an elongate rear portion extending upwardly from the body portion and an inclined front portion extending downwardly from the upper end of the rear
10 portion of the handle to a point on the body portion located forwardly of the point from which the elongate rear portion extends, said elongate rear portion defining a location for receiving and storing said elongate rigid extension tube.
2. A vacuum cleaner as claimed in claim 1, in which the
15 longitudinal axis of the rear portion of the handle is orientated parallel to
3. A vacuum cleaner as claimed in claims 1 or 2, in which the inclined front portion of the handle is arcuate.
4. A vacuum cleaner as claimed in any preceding claim, in
20 which the rear portion of the handle defines a longitudinally-extending passage, for receiving the elongate rigid extension tube.
5. A vacuum cleaner as claimed in claim 5, in which the rear portion of the handle is substantially c-shaped in section.
- 25 6. A vacuum cleaner as claimed in any claim 5, in which the elongate rigid extension tube is retained in the c-shaped rear

portion of the handle by a pair of projecting tabs on the mouth of the passage.

7. A vacuum cleaner as claimed in any claim 7, in which means are provided at the lower end of the passage for receiving
5 the lower end of the elongate rigid extension tube.

8. A vacuum cleaner as claimed in claim 4, in which the passage is provided with an opening at or adjacent the upper end of the rear portion of the handle.

9. A vacuum cleaner as claimed in claim 8, in which the
10 opening extends at least partially down the rear wall of the passage.

10. A vacuum cleaner as claimed in any preceding claim, in which at least one further elongate rigid extension tube or cleaning tool is nested inside said first-mentioned elongate
15 rigid extension tube.

11. A vacuum cleaner as claimed in claim 10, in which the innermost nested elongate rigid extension tube has an end portion having a narrow cross-sectional shape.

12. A vacuum cleaner as claimed in any preceding claim, in
20 which a plurality of cleaning tools are provided for connecting to the end of the or each elongate rigid extension tube, said tools being mounted to the body of the cleaner, adjacent the upper end thereof.

13. A vacuum cleaner substantially as herein described with
25 reference to the accompanying drawings.



INVESTOR IN PEOPLE

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Claims searched: All

Examiner: Richard Gregson
Date of search: 17 May 2000

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): A4F

Int Cl (Ed.7): A47L (5/00, 5/24, 5/28, 9/00, 9/32)

Other: Online: EPODOC, WPI, JAPIO.

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2318279 A (EMACO) - see whole document.	n/a
A	US 5560076 A (LEUNG) - see whole document.	n/a
X	US 4720890 A (GERNOT) - see diagrams and column 8, lines 25-69 in particular	1-5 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention
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